

The Challenge of Communication at Hazmat Incidents

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Abstract

A tool is suggested that should readily improve “passing the word” at HAZMAT incidents. The incorporation of the Five-Paragraph Order (SMEAC) as a standard for HAZMAT response operations orders should significantly increase the safety and effectiveness of the responders.

The Challenge

Many factors and organizational problems tend to exacerbate the intensity of the situation at a response to a HAZMAT incident. By their nature, HAZMAT incidents are typically incidents with multi-hazards that are mitigated by multi-organizational (and possibly multi-jurisdictional) response teams. Therefore, the speed and accuracy of the dissemination and acceptance of mission critical data among the responding elements of an Incident/Unified Command is a paramount concern.

Organizational strength is critical under severe consequence conditions. The challenge to organizational strength is communication. Multiply that challenge by the fact that all too often multi-jurisdictional authorities meet initially at the scene of an incident instead of an exercise.

Some of the factors and problems with communications are a matter of familiarity, such as the simple recognition of other responding organizations, their mission, structure, people, terminology, capabilities, and equipment. Considerable effort has been expended over the years to standardize terminology, organizational structure, and other areas to increase the effectiveness of responding field elements. One very effective approach that has successfully addressed many of these topics is the establishment of the Incident Command System (ICS).

“Site Specific Incident Command” is the strategy to preserve the strength of the organization. OSHA institutionalized specific procedures (i.e. buddy system, decontamination, etc.) and an organization system for dealing with hazardous materials releases. The Incident Command System (ICS) is that organizational system. Within SARA, Title I, 126(f) the government extended the same HAZWOPER requirements to local and state agencies. Although the regulations specify the method, in practice, this required organization often falls short of the expected results.

Not only must the ICS be used but also a “Unified Command System” is often created to manage all the numerous groups responding simultaneously to the incident. The prompt establishment of a Unified Command System can set common priorities and strategies and better manage the resources of these groups. An Incident Commander must be

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leading the actions of the Command System and choose and assign the groups that need to be a part of the Command System. Statute or procedure usually defines the Incident Commander delegates.

Implementing a Unified Command System does create the organization to allow communicating critical information required for good decision-making (priorities and strategies). “Communicating Critical Information” is the instrumental element of “Organizational Strength”. The Incident Commander must lead the Unified Command to identifying critical information and disseminating that information initially and periodically.

Reality

Two actual incidents where communication deficiencies were noted in the after-action critiques are provided to better illustrate the problem.

Incident #1

An ethylene truck was found venting through the relief valve. The hot zone was determined and the area was sealed off. The LEPC deferred the IC responsibility to the local Fire Chief. Two fire departments, an industrial HAZMAT team, two industrial firms’ representatives, the county sheriff’s department, and an emergency medical team handled the scene response.

Each one of the teams acted on their own because the ICS did not provide the communications and mission statement to the individual groups to define roles and responsibilities. The absence of lines of communication slowed the process mitigating the incident and increased the risk to the responders as each group worked on their own solution to the situation. No deaths or injuries resulted and no serious impact to property or the environment occurred.

Incident #2

A plant manufacturing maleic anhydride (UN 2215) developed a major leak on a tank. The IC determined the most appropriate action to best protect the public was to initiate a “shelter in place” order. This critical information was directly relayed to the schools that were six miles downwind from the release. However, not all agencies and especially the general public were given enough information for them to understand the “shelter in place order”. It was not generally understood that there were airborne hazards and that people were to stay indoors. In point, many people were observed on nearby street corners watching the incident. The information directive was not completed.

The communications had broken down as the directive was passed through the chain of command. The hazards of the material if not conveyed appropriately will result in injuries to the public. This incident resulted in 40 employees and contractors and one law enforcement officer needing medical attention.

These two incidents, similar to those that occur across the United States, verify the need for immediate information sharing through the Unified Command using terms understandable to the “receivers” of the information. These “receivers” may be emergency response agencies, public officials, or the general public.

Breakdowns in communication have been identified within the ICS in other previous situations. Too often remedies to communication problems are sought from implementing newer and improved communications equipment, additional frequencies, and the like. This course of action may address many communication needs but it still may not satisfy the problems.

Another possible solution may be ensuring that the communication is complete and unambiguous. When data are presented in an expected and ordered format, acceptance and understanding of that data are greatly increased. Another benefit is akin to a quality assurance process, if a particular expected item of data was either not transmitted or received, the intended receptor requests that particular part be re-transmitted.

Fortunately, there currently exists a format that was designed to do just that. This format is used in the United States and many other countries, and has truly been “tested under fire”.

A Solution

“Passing the word” has always been a critical issue to military leaders from the beginning of time. The recognition of the enemy, the study of the battlefield terrain, the selection of tactics, the designation of appropriate military units for specific missions, etc. are data that must be transferred to subordinate unit commanders. A hazardous material incident may be thought in terms of a military battle. The enemy (the product), terrain, tactics, and deployment of resources are critical to success.

To reliably accomplish this task, today’s allied forces use a standardized protocol to “pass the word”. A combat order containing five distinct paragraphs of information in a specific ordered sequence was developed. It is usually referred to as the Five-Paragraph Order. However, some (i.e. USMC) know it as **SMEAC**.

S – situation

M – mission

E - execution

A – administration and logistics

C – command and signal

Five-Paragraph Order:

Prior to issuing the order, always give a physical orientation. A description of other responding agencies may also be important and should be included.

SITUATION

Basically, this is the information describing the problem. Defining the situation should be a dynamic process starting upon the arrival of the first responders at the scene and continue until the incident scene has been secured. Note: Seek out the Incident Commander (IC) for situation data and inform the IC on any updated info that you may collect.

MISSION

What the team is tasked to accomplish and the location in which the task is to be done.

EXECUTION

How the team plans to perform its mission.

ADMINISTRATION & LOGISTICS

Administration refers to the support organization for the response. That support can include backup teams, additional equipment, decon services, heavy equipment (backhoe, bulldozer, etc.), food/beverage service, and first aid. The Incident Command includes a Logistics Officer to coordinate this support organization.

COMMAND & SIGNAL

A statement of who is in charge and where is he/she located. The command structure should address on site as well as off site command.

Signals should state the radio frequencies and call signs, hand signals, code words, and other signals that may be used during the response.

The Benefits

The simple act of organizing thoughts, ideas, and data into these five paragraphs prior to conveying such information to other people greatly increases a mutual understanding of the operation and everyone's roles and responsibilities in that operation.

A common misconception by many is not realizing the distinct difference between "mission" and "execution". This point alone greatly eliminates the potential for confusion or misdirection if either the mission or execution is later modified, unattainable or simply scrubbed while in the field.

SMEAC was not only meant for the top brass. It was designed to satisfy the needs of the General's large scale operations, through the armies, the divisions, the companies, the platoons, the squads, and finally to the fire teams. Each Five-Paragraph Order is a subset of the previous Order (see Examples A and B). It can readily be used to transfer instructions from the IC to the Ops Officer to the Decon Team or other similar command path. Each responder at the scene of a hazmat incident would know what he/she is doing there, how to do it, where to do it, what is available to help him/her do it and where to get it, who is in charge, who to contact, and what to do if problems develop. SMEAC can make this happen.

Conclusion

A battle against chemicals is as dangerous as a human enemy. The Five-paragraph order (SMEAC) has been tested under fire and has worked so well it is now a protocol used in NATO. Incorporating this method of communication into your response procedures will minimize communication problems and maximize the opportunity for success at hazardous material incidents.

Example A: Search for a Lost Moisture Density Gauge

[As told to the Team Leaders by the Team Captain.]

SITUATION

The time is now 10:38 am. We are located at the corner of Highway 35 and Main Street. This is the control point. A state police unit and a local fire engine company and ambulance are also located here. The wind is from the southwest at 2 mph; no rain expected.

A radiological source/device has been lost in this immediate vicinity. The user describes the device as a moisture density gauge. No other data is available. No other assistance is available for at least the next 3 hours. At that time, a two-man radiological response team from the state will be on site.

MISSION

Locate, identify, isolate, and retrieve (if possible) a lost radiological source/device in the area bounded by Highway 35 to the north, Main St. to the east, the warehouse to the south, and the hardware store to the west.

EXECUTION

Each team will consist of three people: Team leader, Team recorder, and Team monitor.

The team leader will supervise the team's actions and communicate with the radiological response team captain via radio. The team recorder will document measurements and other actions taken by the team. The team monitor will use Zarno Z-2000 detector to take radiation measurements in the field.

Team 2 will survey the perimeter of the area and return to the control point for further instructions.

Team 1 will survey the area after Team 2 returns. If the device is found, place a wire surveyor's flag near the device and radio for further instructions. Do not approach the device until so ordered.

ADMINISTRATION & LOGISTICS

All the IC staff will be located at the control point wearing identifying vests. Lt. Ron Fenner is the Logistics Officer. Take any equipment requests to him directly.

Team 2 will be the backup team for Team 1 after returning from the perimeter survey.

Bottled water is available at the ambulance.

COMMAND & SIGNAL

Lt. Jim Anderson, from the Guffey Fire Department, is the Incident Commander and will be located at the fire engine #925. I am your radiological response team captain and I will be with the Incident Commander. Joe Binotz is the team leader for Team 1.

Bill Shmuckatelli is the team leader for Team 2. In addition, the point of contact with our organization is Tim Moore at (111) 555-4444.

We will be using radio frequency #3. In the event of an emergency, clear the net with "Break, break, break" and describe the emergency. Report every 10 minutes. If you do not receive a response, return to the control point. The fire engine siren will be used to call in all teams.

[Note: *The satisfaction of each of the SMEAC paragraphs is necessary to ensure the successful completion of the mission and safety of the team.*]

Example B: Search for a Lost Moisture Density Gauge

[As told to Team 1 by Team Leader.]

SITUATION

The time is now 10:44 am. The control point is here at the corner of Highway 35 and Main Street. The wind is from the southwest at 2 mph.

An unspecified moisture density gauge was lost in this area. The state rad team will be here in 3 hours.

MISSION

Locate a lost radiological source/device in the area bounded by Highway 35 to the north, Main St. to the east, the warehouse to the south, and the hardware store to the west.

EXECUTION

After Team 2 returns from surveying the area's perimeter, we will enter the area and conduct our survey.

Bob, you are Team 1's recorder. Log all information and survey data on our incident log sheets. Mary, you are Team 1's monitor. Use the Zarno Z-2000 for field measurements. I will also assist in the survey with another Z-2000.

From this position Mary and I will be about 5 meters apart and scan the area traveling back and forth from east to west and back again until having covered the entire area. Bob will trail behind us and record the survey.

If the device is found, we will mark the location with a wire surveyor's flag and contact the Team Captain via radio for further instructions.

ADMINISTRATION & LOGISTICS

Team 2 is our recovery team.

All data, log sheets, and other forms are to be turned in to me upon completion.

At the control point there is bottled water, surveyor's flags, and a medical station.

COMMAND & SIGNAL

I will be with you during the survey. The radiological response Team Captain will be located at the control point.

Place radios on frequency #3. Use standard radio protocol. Return to the control point if you hear the fire engine siren.

[Note: *The satisfaction of each of the SMEAC paragraphs is necessary to ensure the successful completion of the mission and safety of the team.*]

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